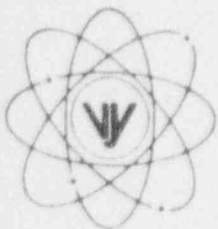


# VERMONT YANKEE NUCLEAR POWER CORPORATION



P.O. Box 157, Governor Hunt Road  
Vernon, Vermont 05354-0157  
(802) 257-7711

May 29, 1997  
BVY 97-71

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D.C. 20555

Reference: (a) License No. DPR-28 (Docket No. 50-271)

Subject: Reportable Occurrence No. LER 97-002, Rev. 1

As defined by 10CFR50.73, we are reporting the attached Reportable Occurrence as LER 97-002, Rev. 1.

Sincerely,

Vermont Yankee Nuclear Power Corporation

Gregory A. Maret  
Plant Manager

cc: USNRC Region I Administrator  
USNRC Resident Inspector - VYNPS  
USNRC Project Manager - VYNPS

IE2211

9706050057 970529  
PDR ADOCK 05000271  
S PDR



NRC Form 366 (4-95) U.S. NUCLEAR REGULATORY COMMISSION  <b>LICENSEE EVENT REPORT (LER)</b>				APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.							
FACILITY NAME (1) VERMONT YANKEE NUCLEAR POWER STATION						DOCKET NUMBER (2) 05000271		PAGE (3) 01 OF 04			
TITLE (4) Inadequate design allows VY Vital Switchgear to be vulnerable to flooding during the Maximum Postulated Flood (MPC) conditions.											
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)		
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NO.(S)	
02	21	97	97	-- 002 --	01	05	29	97	N/A	05000	
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: CHECK ONE OR MORE (11)									
N		20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)			
POWER LEVEL (10) 100		20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)			
		20.2203(a)(2)(i)		20.2203(a)(3)(ii) X		50.73(a)(2)(iii)		73.71			
		20.2203(a)(2)(ii)		20.2203(a)(4)		50.73(a)(2)(iv)		OTHER			
		20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		(Specify in Abstract below or in NRC Form 366A)			
		20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)					
LICENSEE CONTACT FOR THIS LER (12)											
NAME GREGORY A. MARET, PLANT MANAGER							TELEPHONE NO. (Include Area Code) 802-257-7711				
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)											
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	.....	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	
NA				NO	.....	NA					
NA					.....	NA					
SUPPLEMENTAL REPORT EXPECTED (14)						EXPECTED SUBMISSION DATE (15)		MO	DAY	YEAR	
YES (If yes, complete EXPECTED SUBMISSION DATE)				X	NO						

**ABSTRACT** (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 02/21/97 VY discovered the potential for water intrusion into the Vital Switchgear Rooms via underground conduits during Maximum Postulated Flood Conditions (MPC). Were the MPC to occur, switchgear providing electrical power to Division I and II safety systems would need to be de-energized, placing the plant in a vulnerable condition. This potential exists due to an inadequate initial plant design. Presently a Basis for Maintaining Operation (BMO) has been completed to support continued safe plant operation. In-place plant procedures require the Shift Supervisor to initiate plant shut down with flood waters approximately 10 feet below the level at which the switchgear rooms would be challenged should conditions continue to degrade. VY is installing high density silicone seals in conduits which otherwise allowed intrusion of external flood waters into the Switchgear Rooms. This will reduce water introduction into the Switchgear Rooms to an easily manageable rate. Procedures are being revised to specify additional actions to be implemented if a flood occurs. To date the maximum river level that has occurred at the site was an elevation of 231.4 ft. mean sea level (MSL). Because the probability of a MPC flood is extremely low, and the highest level achieved during a previous high water condition was 17.1 ft. below the elevation of concern; this event is not considered to have presented an increased threat to public health and safety.

NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION (4-95)		APPROVED BY CMB NO. 3150-0104 EXPIRES 04/30/98			
LICENSEE EVENT REPORT (LER)		ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.			
FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REV #	
VERMONT YANKEE NUCLEAR POWER CORPORATION	05000271	97	-- 002 --	01	02 OF 04

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

#### DESCRIPTION OF EVENT

On 02/21/97, while operating at 100% power, VY discovered that the potential exists for water intrusion into the Vital Switchgear (EIS=EK) Rooms via underground conduit (EIS=CND) during Maximum Postulated Flood Conditions (MPC). It was previously questioned if water could enter the switchgear rooms via underground conduits connected to the switchgear rooms. The electrical switchgear and distribution equipment located in the rooms, power both division I and division II safety systems.

During the implementation of a 1994 design change a question was raised regarding the possibility of water intrusion into the VY Switchgear Rooms during a flood. The avenue of water intrusion postulated was via underground conduits and into manholes located in the switchgear room floors. The recently completed evaluation of this question concluded that the potential for water to enter the switchgear rooms exists.

Upon discovery of this design vulnerability, VY initiated an Event Report for identification and tracking of the deficiency. Methods to reduce water intrusion into Switchgear room floors have been identified, and a Basis for Maintaining Operation (BMO) was written. This BMO documents the conclusion and supporting basis for continued safe operation of the plant.

#### CAUSES OF EVENT

The apparent cause of this event was the failure to identify the design vulnerability.

Due to the age of this issue, the root cause for the inadequate design cannot be determined. The event investigation continues to determine the potential for similar events or conditions, and assess other opportunities for improvement.

#### ANALYSIS OF EVENT

The entrances to the VY Administration (EIS=MA) and Turbine buildings (EIS=NM) are located at the 252.5 ft. elevation. The VY FSAR Section 2.4 states, "Since the entrances to all of these structures are at elevation 252.5 ft., they are above maximum flood stage and thus, are protected against the maximum probable flood." However, the floor elevation of the switchgear rooms is at the 248.5 ft. elevation. A series of conduits connects the vital switchgear room manholes located in the floor to manholes and handholes distributed around the site property, eventually establishing a flowpath between the switchgear rooms and the intake and discharge structures. Should water enter these manholes, these underground conduits could provide a path for water to enter the switchgear rooms. If the water level reaches 248.5 ft., water intrusion in the switchgear room, and lower levels of the administration and turbine buildings, could be expected unless mitigating actions are taken.

The VY FSAR Table 2.4-9 shows that the maximum VY flood level expected would reach a maximum elevation of 252.5 ft., at a time of 96 hours into the flood. The plant procedure for dealing with floods specifies the actions that VY would implement, including the placement of sandbags to the external entrances to the Turbine, Reactor (EIS=NH), and Administrative buildings.

Should the postulated flooding event occur, the plant would be shutdown when the flood level reaches the 237 ft. elevation, which is approximately 72 hours into the event. This shutdown is required before the intake structure becomes submerged by the flood water. As the level continues to rise, water would begin to flow through conduits connecting these structures to the switchgear rooms; with the water levels in the conduits matching the flood level. Per table 2.4-9, the water level reaches elevation 247.2 ft. 84 hours into the event, and remains above this level for approximately 24 hours. When the flood level reaches the switchgear room floor elevation, water has already filled the duct banks and conduits, and would then attempt to flood the switchgear rooms.

NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION (4-95)		APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.				
LICENSEE EVENT REPORT (LER)						
FACILITY NAME (1)		DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
VERMONT YANKEE NUCLEAR POWER CORPORATION		05000271	YEAR	SEQUENTIAL NUMBER	REV #	
		97	--	002	--	01
						03 OF 04

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

During the 24 hour period in which the flood water level is above elevation 247.2 ft., the switchgear room water level would seek external flood level. Unabated, the water level could reach a level of 4 feet within the rooms. However, water would flow out of the switchgear room doors and into the lower levels of the Turbine Building. The Turbine Building contains no safety system equipment which would be jeopardized by this water intrusion, therefore this drain path would lessen the severity of the MPC upon vital switchgear room water introduction. Due to the construction of the room, a water level of several inches could require de-energizing several safety related distribution centers and motor control centers. As flood level approaches 252.5 ft, a driving head of 4 feet would be established pushing flood waters into the vital switchgear rooms. Switchgear room conditions would eventually require all switchgear within the vital switchgear rooms to be de-energized. De-energizing this switchgear would disable all AC dependent safety systems, which would place the plant in a vulnerable condition.

#### SAFETY SIGNIFICANCE

Plant procedures require the Shift Supervisor to shut down the plant with flood waters approximately 10 feet below the level at which the switchgear rooms would be challenged. Procedures are being revised to specify additional actions to be implemented if a flood occurs. To date the maximum river level that has occurred at the site was elevation 231.4 ft. Because the probability of a MPC flood is extremely low, and the highest level achieved during a previous high water condition was 17.1 ft. below the elevation of concern; this event is not considered to have presented an increased threat to public health and safety

#### CORRECTIVE ACTIONS

##### Immediate Actions:

1. An Event Report was initiated to document this event and initiate a root cause analysis to attempt to determine the root cause and appropriate corrective actions for this event.
2. Preliminary guidance has been provided to Operations that identify methods to minimize water intrusion into the switchgear room, in the event of a flood (this action is complete).
3. A BMO has been generated which defines the deficiency, and equipment involved in this event. This BMO provides the conclusions and supporting basis for assuring that the plant may continue to operate safely. The need for additional compensatory measures will be assessed further (these actions are complete).
4. Meteorological Conditions necessary for the MPC to occur have been reviewed. Atmospheric conditions necessary to create the potential for an MPC are only prevalent from the middle of June through September.

##### Long Term Actions:

1. VY is installing high density silicone seals in conduits which otherwise allowed intrusion of external flood waters into the Switchgear Rooms. This will reduce water introduction into the Switchgear Rooms to an easily manageable rate (expected completion date: 06/07/97)
2. VY is revising plant procedures to identify required actions to manage the limited introduction of water into the switchgear rooms should the postulated flood occur (expected completion date: 06/07/97).

NRC Form 366 U.S. NUCLEAR REGULATORY COMMISSION (4-95)		APPROVED BY OMB NO. 3150-0104 EXPIRES 04/30/98 ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.			
LICENSEE EVENT REPORT (LER)					
FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6)			PAGE (3)
		YEAR	SEQUENTIAL NUMBER	REV #	
VERMONT YANKEE NUCLEAR POWER CORPORATION	05000271	97	-- 002 --	01	04 OF 04

TEXT (If more space is required, use additional copies of NRC Form 366A) (17)

#### ADDITIONAL INFORMATION

The following similar events have been reported in the last five years. Each reported an original plant construction or design inadequacy.

- LER 97-06 Use of an inadequate design implementation document during initial plant construction results in the failure to maintain proper electrical separation of electrical cables.
- LER 97-05 Inadequate design/operating license coordination allows plant configuration which could result in a loss of secondary containment integrity in the event of a LOCA coincident with containment inert/deinert operations.
- LER 97-04 Inadequate design allows VY Vital Switchgear to be vulnerable to flooding from Fire Main rupture.
- LER 97-03 Overpressure protection not provided for turbine building as described in the VY FSAR due to an unknown cause.
- LER 97-01 Inadequate design evaluation allows plant operation under conditions where a single postulated electrical failure coincident with a LOCA could result in containment overpressure.
- LER 96-15 Original B31.1 ANSI Code section that required overpressurization relief for isolated piping section was not considered in the original design.
- LER 96-14 Failure to provide tornado protection for diesel generator rooms as specified in the Final Safety Analysis Report due to unknown cause.
- LER 93-16 Generic failure mechanism in RHRSW pump motor cooling supply due to inadequate original construction design review.